Plant Names and Classification

Chapt. 16

Scientific Names

- Common names - recognized by laypeople; less imposing, simple, easy to remember; may be descriptive; many different names for same organism or no common name; may be misleading; may be used for more than one taxon

- Scientific names - (ideally) a unique name for each organism used worldwide; Latin(ized)

Scientific Names

- provides a unique "identifier" for a taxon
- provides information about the relationships among taxa

Taxonomy

- the branch of biology that deals with the identification, naming and classification of organisms

- Taxonomists

- taxon - a general term that refers to any group of similar organisms

Scientific Names

- Binomial nomenclature - each species name consists of:

  Generic name - e.g. *Andropogon*

  Specific epithet - e.g. *gerardii*

  Big bluestem - *Andropogon gerardii*

Scientific Names (cont.)

Botanists also include an authority(s); indicates who named the taxon and/or revised the classification

e.g. *Andropogon gerardii* Vitman

Fulgenzio Vitman 1728-1806, Italian botanist and clergyman, founded botanical garden in Milan

Schizachyrium scoparium (Michx.)Nash

Michaux originally described little bluestem, but he put it in the genus *Andropogon*. Nash later provided evidence that it should be transferred to the genus *Schizachyrium.*

Classification and Nomenclature

- Theophrastus - died 287 B.C.; classified plants based on leaf morphology

- Doctrine of Signatures - 15th-17th Century

  "God hath imprinted upon the plants, herb and flowers as were it in hieroglyphics the very signature of their virtues." Robert Turner, 1664

- Polynomials - grouped plants into genera; used Latin phrases to distinguish between species

Linnaeus

- 1707-1778
- 1753 - *Species Plantarum*, included polynomials, but also a 2 word "abbreviation" for each species - first consistent use of binomials

- Species - (a population of) similar individuals capable of freely interbreeding and producing fertile offspring; reproductively isolated from similar groups

Linnaeus

- Created a system of 24 artificial "classes" distinguished primarily by stamens and other flower characteristics

- Greatly facilitated identification, but "classes" did not accurately identify phylogenetic relationships

International Code of Botanical Nomenclature

- 1867
- agreed to use *Species Planatarum* as the starting point for scientific names
- agreed to use binomials for species names
- provides standardized rules for naming and classifying plants

International Code of Botanical Nomenclature

- Official recognition of a new plant requires:

  1) publishing a Latin description of the plant in a public publication or journal

  2) deposition of an annotated type specimen in a public herbarium

Taxonomic Groups

- Domain
- Kingdom
- Phylum (Division)
- Class
- Order
- Family
- Genus
- Species

Domains

- Archaea
- Bacteria
- Eukarya

Biochemical evidence suggests three different broad categories of living organisms

Kingdoms

- 6 Kingdom system recognizes

  Archaea (may be elevated to Domain)

  Bacteria (may be elevated to Domain)

  Protista
  Fungi
  Plantae
  Animalia

  combined under Domain Eukarya

Taxonomic Groups

- Domain - Eukarya
- Kingdom - Plantae
- Phylum - Magnoliophyta
- Class - Liliopsida
- Order - Cyperales
- Family - Poaceae
- Genus - *Andropogon*
- Species - *Andropogon gerardii*

Standardized endings for Taxonomic Groups

- Phylum - *ophyta* e.g. *Magnoliophyta*
- Class - *opsida* e.g. *Liliopsida*
- Order - *ales* e.g. *Cyperales*
- Family - *aceae* e.g. *Poaceae*

Examples

	Big Bluestem	Little Bluestem	Annual Sunflower	Piñon Pine
D	**Eukarya**	**Eukarya**	**Eukarya**	**Eukarya**
K	**Plantae**	**Plantae**	**Plantae**	**Plantae**
P	**Magnoliophyta**	**Magnoliophyta**	**Magnoliophyta**	Pinophyta
C	**Liliopsida**	**Liliopsida**	Magnoliopsida	Pinopsida
O	**Cyperales**	**Cyperales**	Asterales	Pinales
F	**Poaceae**	**Poaceae**	Asteraceae	Pinaceae
G	*Andropogon*	*Schizachyrium*	*Helianthus*	*Pinus*
S	*A. gerardii*	*S. scoparium*	*H. annuus*	*P. edulis*

*bold font only used to highlight shared taxons

Dichotomous Keys

- a tool designed to help identify an organism
- most keys are dichotomous - the reader is provided with two choices at each step in the key; selections continually eliminate dissimilar organisms until a single taxon is identified

References

- Flora or Manual - keys, descriptions, perhaps illustrations, distributions, life histories, economic importance, taxonomic problems
- Keys - only identification tools
- Guides - generally nontechnical